

TABLE 1

Appendix I

1. New Tests

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
1. FFA*, FFA*	Oil Fish Bakery Fast Food Oil in Frying	With or without any other analytes or membrane MCE .45 or Durapore .45 to remove particulates				XO				Spectral 570 or (visual) or color wheel	
2. LPO/FFA	Oil or olive	MCE	Nylon linked decanyl polymers or silica to bind LPO			XO	XO and Fe* (acidified)			Spectral Spectral	
3. LPO/FFA*	Oil	MCE	Silica			XO	reduced hemoglobin				
4. LPO/FFA/MDA	Oil/Seafood	MCE	Silica	Diethylamine		XO	XO (Fe ⁺ Acidified)	MI		Spectral	
5. LPO, MDA, FFA after oxidative stress	Oil	MCE	Silica	Diethylamine		XO	XO (Fe ⁺ Acidified)	MI		% change proportional to shelf life Use viable meat. Color change	
6. LPO, MDA, FFA After oxidative stress	Oil Fish Bakery	MCE to remove particulates	Silica to bind LPO	Diethylamine to bind MDA		XO	XO (Fe ⁺ acidified)	MI		Spectral	
7. LPO after oxidative stress	Fish Oil	MCE	MCE			XO (Fe++ acidified)				Spectral	

Fig. 18A

1. New Tests

Analytes	Typical Matrix	Membranes					Reagents					Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	M ₅	R ₁	R ₂	R ₃	R ₄			
8. FFA after Oxidative Stress	Oil	MCE					XO					Spectral	
9. Polyphenol/LPO	Oil, Olives, Fruit, vegetables	MCE	Silica to bind LPO				Folin (Cocalteu)	XO (Fe ⁺ acidified)				Spectral	
10. Polyphenol	Oil	MCE					Folin (Cocalteu)					Spectral	
11. Polyphenol and FFA	Oil Fruit Vegetables	MCE	Carboxymethyl to bind Polyphenol				XO	Folin Cocalteu				Spectral	
12. Polyphenol MDA/LPO/FFA	Oil Fruit Vegetable	0.8 um to bind particulates	Silica or nylon with lipid solubilizing decalayer to bind LPO	Carboxy methyl weakly acidic membrane to bind polyphenols		diethylamine to bind MDA	XO	XO (Fe ⁺ acidified)	Folin (cocalteu)	MI		Spectral	
13. LPO Ratio for Antioxidant Status	Oil Fish	MCE					XO/Fe ⁺ acidified					Spectral	
14. Unsaturated linkage/LPO Value	Oil	MCE	Lipid solubilizing polymer attached nylon bind LPO				I ₃ → I ₂	XO (acidified Fe)				Spectral	
15. Unsaturated linkage, MDA	Oil	MCE	diethylamine				I ₃ → I ₂	MI				Spectral	
16. LPO, FFA, Histamine*	fish beverage	MCE	Sulfonic Acid	Silica			XO	DAO and XO+Fe ⁺ acidified	XO (Fe ⁺ acidified)			Spectral	

Fig. 183

1. New Tests

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
17. LPO/FFA/MDA	Fish beverage	MCE for particulates	Diethylamine to bind aldehydes for MDA	Lipid solubilizing polymer bound nylon to bind LPO		XO test for FFA	MI test for MDA	XO (Fe ⁺ acidified) LPO		Spectral	
18. LPO/Histamine**	Fish cheese sausage	MCE	Biotinylated Q for histamine binding			XO Fe ⁺ acidified	diamine oxidase and XO Fe (acidified)			Spectral	
19A. Polymer vs. non-polymer triglycerides	Cooking Oils	Membrane with MW Cutoff 500				Lipase with glycerol kinase +	detect H ₂ O ₂ with chromogen			Spectral	
19B. Polymer vs. non-polymer Oxidized trigly	Cooking Oil	MW cutoff 500				Lipase/glycerol 3 PO ₄ oxidase				Spectral	
20. Mycotoxin1, Mycotoxin2 Mycotoxin 3	Grain	MCE	mab ₁ bound NH ₂ on regen cellulose	mab ₂ bound NH ₂ on regen cellulose	mab ₃ bound NH ₂ on regen cellulose	Mycotoxin1 enzyme conjugate	Mycotoxin2 enzyme conjugate	Mycotoxin3 enzyme conjugate (peroxidase mycotoxin conjugate) Measure H ₂ O ₂ produced		Spectral	
21. MDA/Sulfur	beer wine	MCE Prefilter or verapapor prefilter	IDA to remove pigments and metals	Sambad Q to bind aldehydes		Fe ⁺ (XO) ↓ Fe ⁺ (XO) blue → yellow For sulfide	MI for MDA			Spectral	
22. ATP Separation from ADP & AMP	fish other living material degradation	MCE Prefilter or negative adsorber	Diethylamine			ATP detected by bioluminescence detection luminol	ADP + AMP by bioluminescence detection luminol			Spectral	

Fig. 18C

1. New Tests

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
23. Histidine/Histamine	fish	MCE	Carboxymethyl to bind histamine			TRPB detect histamine Tetrabromophenol blue	DAO + HRP + Methylene blue Detect Histamine			Spectral	
24. Histamine	wine, fish	[iminodi acetic acid to (bind pigments) remove metals]	IDA membrane to bind metal			DAO + XO Fe ⁺ acidified				Spectral	
25. Separation histamine* from all rest amines	Fish Sausage Cheese	[iminodi acetic acid remove metals]	Sulfonic acid membrane bind other amines			DAO + XO Fe ⁺ acidified	measure rest amines using Xylyl blue			Spectral	
26. Total Polar Compounds	Cooking Oil	Silica to bind polar				quantize non-polar lipase and ***	quantize polar lipase ***			Spectral	
27. Total Polar Compounds	Cooking Oil	Bind non-polar to hydrophobic membrane				quantize polar ***	quantize non-polar ***			Spectral	
28. FFA or biliary acids	plasma or serum cow, human	MCE to remove the etc. lipo proteins				XO to test for FFA				Spectral	

* Proprietary

** After Stress

*** lipase → glycerol and ATP → glycerol kinase and pyruvate kinase lactate dehydrogenase

* called acidity value fish, bakery, wine

Fig. 18D

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
29. Polyphenol/FFA for prediction of adulteration	Oils	MCE	Carboxymethyl			XO	Folin Ciocalteu			Spectral	
30. Polyphenol/FFA LPO to predict adulteration & aging	Oils	MCE	Carboxymethyl to bind polyphenol	Silica		XO	XO (Fe ⁺ acidified)	Folin Ciocalteu		Spectral	
31. Polyphenol/FFA to predict adulteration	Oils	MCE	Carboxymethyl			XO	Folin Ciocalteu			Spectral	
32. LPO/MDA/Acidity Irradiation	Oils Fish	MCE	Silica	diethylamine		XO	XO Fe ⁺ (acidified)	MI		Spectral	
33. To Predict time for mycotoxin growth	grain	MCE				XO (Fe ⁺ acidified)				Spectral	
34. FFA distribution	Oil predigested with lipase	MCE	Mab ₁ to Oleic	Mab ₂ Stearic	Mab ₃ - Linoleic	XO	XO	XO		Spectral	Same ratio predict oil type oleic/stearic/linoleic
36. Polyphenol/FFA/TG	Oil	MCE	Strong acid sulfonic bind ROH ⁺	Lipid solubilizing polymer bound nylon to lipid peroxides		XO	Folin Ciocalteu for polyphenol	Enzymatic determination triglyceride = TG with lipase as in 19A		Spectral	
37. Anions	Beer	MCE	IDA			flush FeCl ₃ replace anions change color				Spectral	
38. Aldehyde, bisulfides	Beer	MCE	diethylamine			Fe ³⁺ (XO) reduced by bisulfide	MI			Spectral	
39. Protein, aldehyde	Beer	MCE	diethylamine			Commauxie Blue for protein	MI			Spectral	

Fig. 18E

Analytes	Typical Matrix	Membranes			Reagents					Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
50. Tetracycline Antibiotics in milk	Milk	MCE	decallyl coated membrane			direct read at 365 nm			.	365nm Spectral	
51. Aflatoxin	Milk and Aflatoxin Conjugate	MCE				Enzyme substrate = peroxidase aflatoxin conjugate and urea peroxide and tetramethylbenzidine chromogen				Spectral	

PPO - Polyphenol

Fig. 18F

Others

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
52. Microbes	Food	Versapor Particulates	IGN-6 binds microbes			Direct				Reflectance	
53. Metals	Food	Versapor Particulates	IDA to bind Metal			Test for metals Zincron Zincron + Metal → deep blue				Spectral	

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
54. Any Analytes	Food	Stacked bundle 8, 45 of M1 + M2++				Any of above				Spectral	

**Laminated

DEAE Cellulose
Nylon

Fig. 186

2. Chemical /Personal Care

LPO Reagent Only

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
1	LPO, FFA, and MDA										
2	Fragrance Oil	MCE				XO		XO (Fe+ acidified)		Spectral	
3	LPO after oxidative stress to predict shelf life	MCE	deishylamine	Silica			MI			Spectral	
4	LPO after UV exposure to determine SP or UVA	MCE					XO (Fe+ acidified)			Spectral	
5	LPO after stress formulation	MCE					XO (Fe+ acidified)			Spectral	Test to UVA
	Formulation with or without stress; compare formulation Trolox	MCE					XO (Fe+ acidified)			Spectral	Test efficacy
	Oxidative stressed cells digest	Versapor					XO (Fe+ acidified)			Spectral	Oxidative stress prediction mode of action

Stress "toxicant" take sample before and after stress

Fig. 18H

3. Medical

Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
		M ₁	M ₂	M ₃	M ₄	R ₁	R ₂	R ₃	R ₄		
1. VLDL LDL HDL	Serum	Membrane 300,000 MW trap VLDL	Membrane 100,000 MW cut-off trap LDL	Membrane 10,000 MW cut-off trap HDL		quant VLDL cholesterol (Use cholesterol oxidase end substrate)	LDL cholesterol oxidized	HDL cholesterol oxidized		Spectral 510	
2. LDL and oxidized LDL (LDL _o)	Serum	300,000 MW cut-off membrane	LDL- Trapped diethyl amine			LDL cholesterol detection	Raise LDL- Cholesterol detection oxidized			Spectral 510	
3. LPO to determine AOS	Serum	MCE				XO Fe ⁺ Acidified				Spectral	
4. LPO in serum to determine age	Serum	MCE				XO Fe ⁺ Acidified				Spectral	
5. FFA	Serum	MCE				XO				Spectral	

Fig. 187